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Bioacoustical Oceanography Workshops: The Next Generation

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LONG-TERM GOALS

The primary goal of our project is to provide advanced undergraduates, graduate students, and postdoctoral investigators with a broad understanding of ocean acoustics as well as the techniques used to study the ecology of marine animals in situ. By bringing together many of the top researchers in marine bioacoustics, biological oceanography, and marine biology, we provide students with a unique opportunity to work side by side with world experts using state-of-the-art tools and technologies. A secondary goal of the project is to provide a setting for developing and testing new technologies. In this manner, it serves as a research magnet, attracting leading scientists to conduct their own research in a creative teaching and learning environment that catalyzes interactions across the various disciplines associated with Bioacoustical Oceanography.

OBJECTIVE

To provide students with a broad understanding of the acoustic techniques used to study the distribution and behavior of marine animals in the context of their physical/chemical/biological environment.

APPROACH

Through lectures, demonstrations, and field exercises, we provide students with a unique opportunity to learn and work side by side with top scientists using state-of-the-art bioacoustic tools and techniques. Students participated in a 15-h cruise to Saanich Inlet, British Columbia, where they conducted acoustics surveys with two multi-frequency scientific echo sounders (BioSonics and Simrad) and a multi-beam sonar (Figure 1).

WORK COMPLETED

Thirteen students were trained in an intensive, 5-week Marine Bioacoustics course offered at Friday Harbor Laboratories in Friday Harbor, WA during Summer 2007. Two of these students had participated in the two-week course offered in Hawaii during Winter 2006.

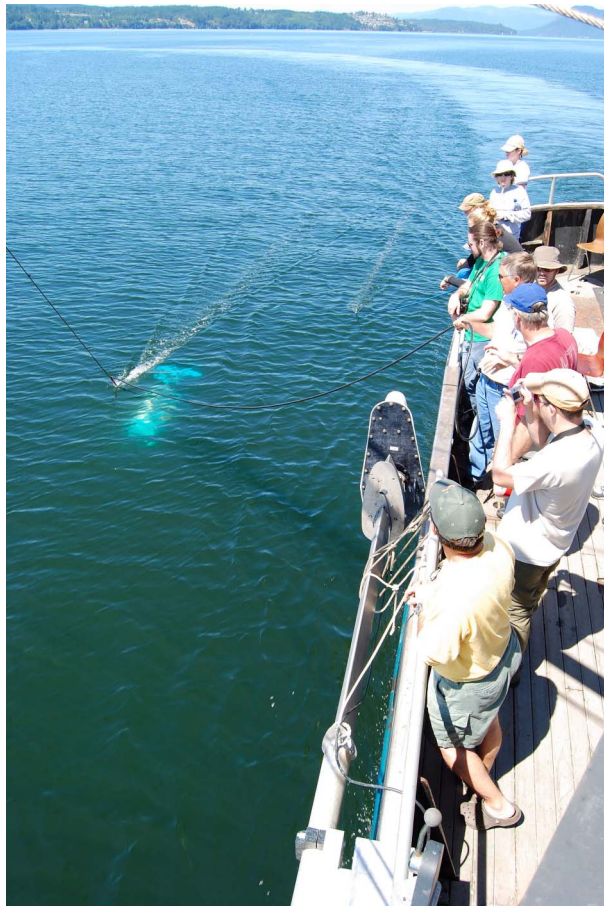


Figure 1: Deployment of multi-beam sonar and echo sounder during Saanich Inlet cruise.

RESULTS

Highlights of student projects include:

1. A rigorous examination of different software packages used to classify animal sounds,
2. An analysis of 3-dimensional fish school structure in Saanich Inlet, British Columbia based on multibeam- and echo-sounder data collected during a class cruise,
3. An analysis using forward- and inverse-problem approaches to investigate a krill sound-scattering layer in Saanich Inlet, British Columbia based on multi-frequency echo-sounder data collected during a class cruise,
4. An analysis of seal vocalizations near a fixed hydrophone array located on the west side of San Juan Island.

IMPACT

Students from around the world come to these courses because they provide the best training available in Bioacoustical Oceanography. Student participants in this year's course represented the following countries: Canada (1), France (1), Germany (1), Ireland (1), Portugal (1), United States (8). This brings our total numbers of students since 1993 up to 166 students from 25 different countries. Both summer and winter courses have acted as research magnets, attracting top scientists to integrate their own research with our educational program. Alumni from our series of courses have become national and international leaders in the field of Bioacoustical Oceanography.

RELATED PROJECTS

None